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FOREST INSECT AND DISEASE MANAGEMENT

Technology Update

Southeastern Area, State and Private Forestry, 1720 Peachtree Road, N.W., Atlanta, Ga. 30367

Southern Pine Beetle Fact Sheet Number 8

FRONSIM, A COMPUTER PROGRAM MODEL

DESCRIPTION

FRONtalis SIMulator, or FRONSIM, is a model that simulates the physical and monetary damage southern pine beetle (SPB) infestations will cause in the future to large (multi-county) areas. Physical damage is defined as the volume of timber lost due to tree mortality.

METHODOLOGY

Physical damage is estimated by simulating the number of SPB spots appearing over time and calculating the volume of timber in these spots, using local volume tables. Monetary values are then applied to the volume. Only monetary losses in the year of mortality are evaluated.

The user has the option of selecting either a completely random model or a regression model to predict the number of spots. The selection will depend on the type of data available as well as the geographic area under consideration. Regression coefficients have been developed for east Texas. The regression model can be used ony in the Gulf Coastal Plain.

Primary Inputs

1. The mean and standard deviations of the number of spots for each month.

2. The mean and standard deviations of the temperatures for each month (regression model only).

3. The proportion of spots identified but not tallied in the survey.

4. The proportion of pulpwood and sawtimber salvaged.

5. The market prices for affected and unaffected sawtimber and pulpwood.

6. The frequency distribution of the number of trees per spot.

7. The frequency distribution of the affected trees in each diameter-at-breast-height (d.b.h.) class.

8. The cubic-foot volume per tree for each d.b.h. class.

9. The board-foot conversion table for each d.b.h. class.

10. The percent estimated damage reduction in a particular year attributable to a proposed management program (optional).

Outputs

1. Number of spots in future years.

2. Volume of timber damaged in future years.

3. Value of volume damaged in future years.

COMMENTS

This program is designed to simulate damage with minimal data requirements. The simulation is based on historic trends and a random number generator. The economic package currently incorporated in the program should be updated;the model is limited for use on large land areas.

While the model provides information on the damage attributable to SPB for the next several years, the year-to-year variations tend to be influenced by the number of iterations performed by the computer. The number of iterations is a user option, and there are no criteria to aid in selecting an appropriate number. For these reasons, FRONSIM should be viewed as a model that provides an estimate of the SPB damage that can be expected, on the average, for any future year. It should not be used to predict year-to-year fluctuations.

FURTHER INFORMATION

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REFERENCES

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